



## Method for production of C30-aldehyde carotenoids

**Description of Technology:** This invention is in the field of microbiology. More specifically, this invention describes the production of C.sub.30-aldehyde carotenoids in genetically transformed microorganisms.

### Patent Listing:

1. **US Patent No. 7,098,000**, Issued August 29, 2006, "Method for production of C30-aldehyde carotenoids"

<http://patft.uspto.gov/netacgi/nph-Parser?Sect2=PTO1&Sect2=HITOFF&p=1&u=%2Fnetacgi%2FPTO%2Fsearch-bool.html&r=1&f=G&l=50&d=PALL&RefSrch=yes&Query=PN%2F7098000>

**Market Potential:** Carotenoids represent one of the most widely distributed and structurally diverse classes of natural pigments, producing pigment colors of light yellow to orange to deep red. Eye-catching examples of carotenogenic tissues include carrots, tomatoes, red peppers, and the petals of daffodils and marigolds. All photosynthetic organisms, as well as some bacteria and fungi, synthesize carotenoids. These pigments have important functions in photosynthesis, nutrition, and protection against photooxidative damage. For example, animals do not have the ability to synthesize carotenoids but must instead obtain these nutritionally important compounds through their dietary sources.

The problem to be solved is to develop a system for production of C.sub.30-aldehyde carotenoids.

Applicants have solved the stated problem by engineering microorganisms for the production of C.sub.30-aldehyde carotenoids. Specifically, Applicants have identified two unique open reading frames encoding the enzymes CrtN and CrtN2 from a *Methylobacter* sp. and co-expressed these enzymes with the CrtM and CrtN C.sub.30-carotenoid biosynthesis enzymes from *Staphylococcus aureus* in *Escherichia coli*. This leads to the production of diapocarotene dialdehyde. Subsequent metabolic engineering of the host demonstrated that synthesis of this C.sub.30-carotenoid could be modified such that it would be produced in levels suitable for industrial purposes.

### Benefits:

- Produces carotenoid in levels suitable for industrial purposes

### Applications:

- Pharmaceutical industry, food supplements, cosmetics, and animal feed additives.

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